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10/038,139	01/02/2002	Baiming Gao	42390.P13117	7438

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EXAMINER

GORDON, CARLENE MICHELLE

ART UNIT	PAPER NUMBER
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2124

DATE MAILED: 12/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 10/038,139	Applicant(s) GAO ET AL.	
	Examiner Carlene Gordon	Art Unit 2124	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 11-16, 21, 26 is/are rejected.
- 7) ☒ Claim(s) 7-10, 17-20 and 27-30 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 January 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

1. This action is responsive to the application filed on January 02, 2002.

Claims 1-30 are pending in the application.

Oath/Declaration

2. The Oath is objected to because it does not include several applicant's signatures.

Baiming Gao.

Yun Wang.

Drawings

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description:

Reference Number 111 of Figure 1.

Reference Number 119 of Figure 1.

"Rtn" of Figure 3B not explained in specification.

Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the

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changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

4. The disclosure is objected to because the Brief Summary of the Invention is not included with the content of the Specification. See MPEP 608.01(d).

5. The disclosure is objected to because of the following informalities:

Spelling of "incorporated" should remove "ed".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 2-3, 12-13, and 22-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

8. Claims 2 and 12 recite the limitation "determining an excepted instruction in the source architecture corresponding to the translated code that raised the exception" in lines 2-3 of claim 2 and lines 3-4 of claim 12. There is insufficient antecedent basis for this limitation in the claim.

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Claim 22 recites the limitation " the binary translation process further causes the processing unit to determine an excepted instruction in the source architecture corresponding to the translated code that raised the exception " in lines 1-3 of claim 22. There is insufficient antecedent basis for this limitation in the claim.

As to claims 2, 12, 22:

The "translated code" is not claimed to definitely raise an exception in claim 1, as claim 1 states:

"if an exception is raised while executing the translated code".

9. As to claims 3, 13, and 23:

Rejection of the base claims is necessarily incorporated.

10. Claim 23 recites the limitation "The apparatus of claim 14" in line 1 of claim 23. There is insufficient antecedent basis for this limitation in the claim.

For the purpose of examination and consistency with the application, claim 23 will be interpreted as follows:

The apparatus of claim 22, wherein the binary translation process further causes the processing unit to determine an exception type for the exception that was raised, and examine the exception mask in the source architecture associated with the excepted instruction to analyze a result.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 1-5, 11-15, and 21-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dunn et al. (USPN 6,314,560), hereafter "**Dunn**" and Brauch (USPN 6,173,248), hereafter "**Brauch**", and further in view of Babaian et al. (USPN 6,732,220), hereafter "**Babaian**".

13. As to claim 1:

Dunn executing translated code in the target architecture (col. 3 lines 29-30 "translated target code is executed on the target platform"),

and determining a state for a source architecture if an exception is raised while executing the translated code (col. 3 lines 14-46; Abstract "recovers from exception properly by... restoring... to the machine state expected by the legacy system" – Interpreted as a state for the source architecture being determined.) .

Dunn does not explicitly disclose mapping a plurality of exception masks to an exception mask. Dunn does disclose the mapping of the code containing exceptions (Abstract).

However, Brauch discloses mapping a plurality of exception masks in a source architecture to an exception mask in a target architecture (col. 1 lines 52-60 "must deliver exceptions", col. 2 lines 46- 54 "maintaining a virtual exception

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mask that indicates what the emulated application's exception mask would be if it were running on the old architecture");

At the time of the applicant's invention it would have been obvious to one of ordinary skill in the art to combine the teaching of Brauch with the teaching of Dunn for handling exceptions between foreign architectures. One would have been motivated to include in the mapping of the translated code of Dunn, a mapping of exception masks as taught by Brauch because Brauch teaches improvements in exception-handling techniques and a means for more accurately emulating the exception behavior a program would exhibit if it were running on the legacy platform for which it was originally constructed, as suggested by Brauch in col. 2 lines 22-44.

Dunn and Brauch do not explicitly disclose the translated code representing binary code in the source architecture.

Babaian teaches an analogous method of translating code from a source to a target architecture. Babaian discloses a binary translation process (Fig. 3; col. 1-2 "Binary translation") wherein a code to be translated represents binary code in a source architecture (col. 1 line 60 – col. 2 line 4 "code translated to a corresponding instruction" "binary translated code"). At the time of the applicant's invention, one of ordinary skill in the art would have been motivated to translate the legacy source code of Dun in binary (col. 1 lines 60-62, "not require legacy source code"). The modification would have been obvious because one of ordinary skill in the art would be motivated to provide portability of code to be executed on a target computer system that would achieve the same result as if

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the foreign code were executed by the foreign computer system as suggested by Babaian in col. 1 line 60 – col. 2 line 3.

14. As to claim 2:

Rejection of claim 1 is incorporated and further Dunn discloses determining an excepted instruction in the source architecture corresponding to the translated code that raised the exception (col. 1 lines 38-42 “instructions are translated into a functionally equivalent... code”; col. 5 lines 13-50 “exception occurs”);

restoring the state of the source architecture to a pre-instruction state (col. 3 lines 14-28 “restore... state to the legacy machine state”);

re-executing the translated code corresponding to the excepted instruction; and analyzing a result of re-executing the translated code (col. 3 lines 43-49 “control of the program to resume...” “now functions correctly”).

Dunn does not explicitly disclose masking all exceptions in the exception mask in the target architecture.

However Brauch discloses an exception mask in which all exceptions are capable of being masked (col. 4 lines 47-61; Fig. 2 “exception mask”).

At the time of the applicant's invention it would have been obvious to one of ordinary skill in the art to combine the invention of Brauch with the analogous art of Dunn for handling exceptions between foreign architectures. One of ordinary skill would have been motivated to include the exception mask of Brauch to be used with the disclosure of Dunn for masking all the exceptions in

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the exception mask in the target architecture because Brauch's exception mask allows for the simple masking of different types of exceptions by the use of "0" or "1" to designate the masking of the exception as taught by Brauch (col. 4 lines 47-61). Furthermore, Brauch mask is a virtual mask affording a simulation of the behavior of the code encountering synchronous exceptions, such as the synchronous exceptions of Dunn as suggested by Brauch in col. 1 and 3.

15. As to claim 3:

Rejection of claim 2 is incorporated and further Dunn discloses determining an exception type for the exception that was raised (col. 3 lines 43-49 "exception handler"; col. 1 lines 60-65 "synchronous exception").

Dunn does not explicitly disclose examining the exception mask in the source architecture associated with the excepted instruction.

However Brauch discloses examining the exception mask in the source architecture associated with the excepted instruction (col. 2 lines 45-55 "mask would be running on the old architecture").

At the time of the applicant's invention it would have been obvious to one of ordinary skill in the art to combine the invention of Brauch with the analogous art of Dunn for handling exceptions between foreign architectures. One of ordinary skill would have been motivated to include the exception mask of Brauch to be used with the disclosure of Dunn because Brauch's exception mask allows for the simple masking of different types of exceptions by the use of "0" or "1" to designate the masking of the exception as taught by Brauch (col. 4 lines

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47-61). Furthermore, Brauch mask is a virtual mask affording a simulation of the behavior of the code encountering synchronous exceptions, such as the synchronous exceptions of Dunn as suggested by Brauch in col. 1 and 3.

16. As to claim 4:

Rejection of claim 1 is incorporated and further Dunn discloses selecting the state for the source architecture based on an exception type if the exception is genuine (col. 1 line 52 – col. 2 line 5 “recovery from synchronous exceptions”, “Synchronous exceptions arise as a direct result”).

17. As to claim 5:

Rejection of claim 1 is incorporated and further Dunn discloses selecting a post-instruction state for the source architecture if the exception is erroneous (col. 6 lines 9-43 “exception... invalid” “recovery block code executes... state”).

18. As to claim 11:

This is a machine readable version of claim 1 wherein Dunn executing translated code in the target architecture (col. 3 lines 29-30 “ translated target code is executed on the target platform”),

and determining a state for a source architecture if an exception is raised while executing the translated code (col. 3 lines 14-46; Abstract “recovers from exception properly by... restoring... to the machine state expected by the

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legacy system” – Interpreted as a state for the source architecture being determined.) .

Dunn does not explicitly disclose mapping a plurality of exception masks to an exception mask. However, Dunn discloses the mapping of the code containing exceptions (Abstract).

However, Brauch discloses mapping a plurality of exception masks in a source architecture to an exception mask in a target architecture (col. 1 lines 52-60 “must deliver exceptions”, col. 2 lines 46- 54 “maintaining a virtual exception mask that indicates what the emulated application's exception mask would be if it were running on the old architecture”);

At the time of the applicant's invention it would have been obvious to one of ordinary skill in the art to combine the invention of Brauch with the analogous art of Dunn for handling exceptions between foreign architectures. One would have been motivated to include in the mapping of the translated code of Dunn, a mapping exception masks of Brauch because Brauch's invention provides for improvements in exception-handling techniques and provides a means for more accurately emulating the exception behavior a program would exhibit if it were running on the legacy platform for which it was originally constructed, as suggested by Brauch in col. 2 lines 22-44.

Dunn and Brauch do not explicitly disclose the translated code representing binary code in the source architecture.

Babaian teaches an analogous method of translating code from a source to a target architecture. Babaian discloses a binary translation process (Fig. 3;

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col. 1-2 "Binary translation") wherein a translated code represents binary code in a source architecture (col. 1 line 60 – col. 2 line 4 "code translated to a corresponding instruction" "binary translated code"). At the time of the applicant's invention, one of ordinary skill in the art would have been motivated to translate the binary code of Babaian as a replacement for the legacy source code of Dun (col. 1 lines 60-62, "not require legacy source code"). The motivation would have been to provide portability of code to be executed on a target computer system that would achieve the same result as if the foreign code were executed by the foreign computer system as suggested by Babaian in col. 1 line 60 – col. 2 line 3.

19. As to claim 12:

Rejection of claim 11 is incorporated and further see rejection of claim 2.

20. As to claim 13:

Rejection of claim 12 is incorporated and further see rejection of claim 3.

21. As to claim 14:

Rejection of claim 11 is incorporated and further see rejection of claim 4.

22. As to claim 15:

Rejection of claim 11 is incorporated and further see rejection of claim 5.

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23. As to claim 21:

This is an apparatus version of claim 1 including, as disclosed by Dunn, a processing unit coupled to a memory through a bus and a translation process executed from the memory by the processing unit to cause the performing of steps that follow (col. 4 lines 30-62 "processor architecture").

Dunn further discloses:

execute translated code representing code in the source architecture (col. 4 "translation system..."; col. 3 lines 29-30 "translated target code is executed on the target platform"), and

determine a state for the source architecture if an exception is raised while executing the translated code (col. 3 lines 14-46; Abstract "recovers from exception properly by... restoring... to the... state expected by the legacy system" – Interpreted as the state for the source architecture.).

Dunn does not explicitly disclose mapping a plurality of exception masks in a source architecture to an exception mask. However, Dunn discloses the mapping of the code containing exceptions (Abstract).

However, Brauch discloses mapping a plurality of exception masks in a source architecture to an exception mask in a target architecture (col. 1 lines 52-60 "must deliver exceptions", col. 2 lines 46-54 "maintaining a virtual exception mask that indicates what the emulated application's exception mask would be if it were running on the old architecture").

At the time of the applicant's invention it would have been obvious to one of ordinary skill in the art to combine the invention of Brauch with the analogous

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art of Dunn for handling exceptions between foreign architectures. One would have been motivated to include in the mapping of the translated code of Dunn, a mapping exception masks of Brauch because Brauch's invention provides for improvements in exception-handling techniques and provides a means for more accurately emulating the exception behavior a program would exhibit if it were running on the legacy platform for which it was originally constructed, as suggested by Brauch in col. 2 lines 22-44.

Dunn and Brauch do not explicitly disclose the binary translation process wherein the translated code represents binary code in the source architecture.

Babaian teaches an analogous method of translating code from a source to a target architecture. Babaian discloses a binary translation process (Fig. 3; col. 1-2 "Binary translation") wherein a translated code represents binary code in a source architecture (col. 1 line 60 – col. 2 line 4 "code translated to a corresponding instruction" "binary translated code"). At the time of the applicant's invention, it would have been obvious for one of ordinary skill in the art to translate the binary code of Babaian as a replacement for the legacy source code of Dunn (col. 1 lines 60-62, "not require legacy source code"). The motivation would have been obvious because one of ordinary skill in the art would have been motivated to provide portability provided by the binary code to be executed on a target computer system that would achieve the same result as if the foreign code were executed by the foreign computer system as suggested by Babaian in col. 1 line 60 – col. 2 line 3.

24. As to claim 22:

Rejection of claim 21 is incorporated and further see rejection of claim 2.

25. As to claim 23:

Rejection of claim 22 is incorporated and further see rejection of claim 3.

26. As to claim 24:

Rejection of claim 21 is incorporated and further see rejection of claim 4.

27. As to claim 25:

Rejection of claim 21 is incorporated and further see rejection of claim 5.

28. Claims 6, 16, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dunn, Brauch, and Babaian as applied to claims 1, 11, and 21 above, and further in view of Temple (USPN 5,937,199), hereafter "**Temple**".

29. As to claim 6:

Rejection of claim 1 is incorporated and further Dunn, Brauch, and Babaian do not disclose performing a logical AND operation on the plurality of exception masks.

However Temple discloses performing logical AND operation on mask.

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It would have been obvious for one of ordinary skill in the art at the time the invention was made to combine the analogous art of handling exceptions of Temple with the arts of Dunn, Brauch, and Babaian to perform a logical AND operation on the plurality of exception masks of Brauch. The modification would have been obvious because one of ordinary skill would be motivated to pass along only the genuine exceptions that are to occur in the translated code of Dunn, as Temple teaches a method for blocking unwanted exceptions in col. 5 lines 20-33.

30. As to claim 16:

Rejection of claim 11 is incorporated and further see claim 6.

31. As to claim 26:

Rejection of claim 21 is incorporated and further see claim 6.

Allowable Subject Matter

32. Claims 7-10, 17-20, and 27-30 are objected to as being dependent upon a rejected base claims, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

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33. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Davis et al. (USPN 6,728,950).

Safford et al. (USPN 6,681, 322).

34. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carlene Gordon whose telephone number is (571) 272-3722. The examiner can normally be reached on Mon.-Fri. 10:00am-6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kakali Chaki can be reached on (571) 272-3719. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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CG *ICM*

Kakali Chaki

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